

Amendments to the Claims

This listing of claims replaces all prior versions and listings of claims in the application.

Listing of Claims:

1. (Currently Amended) A method for member initialization to an asynchronous data replication group in a database system, the method comprising:

- (a) initiating subscription for a new member ~~at~~ by an initiator, wherein the initiator is an active member in the replication group;
- (b) sending a list of active members in the replication group from the initiator to the new member;
- (c) sending subscription information for the new member to each active member in the replication group;
- (d) validating a subscription to the new member at each active member and sending an acknowledgement to the initiator; and
- (e) determining that an acknowledgement from each active member has been received by the initiator.

2. (Currently Amended) The method of claim 1, further comprising:

- (f) determining that a loading of data onto the new member is required;
- (g) loading the data from the initiator to the new member;
- (h) storing current replication messages from the active members onto at least one spill queue;
- (i) determining that the loading of the data has completed; and

(j) applying the replication messages stored on the at least one spill queue to the new member.

3. (Currently Amended) The method of claim 1, wherein the initiating (a) subscription for a new member comprises:

(a1) inserting a signal into a signal table of the initiator to initiate the subscription for the new member.

4. (Currently Amended) The method of claim 1, wherein the sending (b) a list of active members in the replication group comprises:

(b1) computing the list of active members in the replication group by the initiator;

(b2) changing a subscription state for the new member to 'initializing' at the initiator; and

(b3) sending the list of active members from the initiator to the new member.

5. (Currently Amended) The method of claim 1, wherein the sending (e) subscription information for the new member comprising comprises:

(e1) receiving the list of active members from the initiator by the new member;

(e2) sending the subscription information for the new member from the new member to each active member in the list of active members; and

(e3) changing a subscription state at the new member for each active member to 'active'.

6. (Currently Amended) The method of claim 1, wherein ~~the validating (d)~~ a subscription to the new member at each active member and sending an acknowledgement to the initiator comprises:

(d1) receiving the subscription information for the new member by each active member from the new member;

(d2) changing a subscription state for the subscription to the new member to 'active' at each active member, if no loading of data into the new member is required;

(d3) changing the subscription state for the subscription to the new member to 'loading' at each active member, if loading of data into the new member is required;

(d4) informing the initiator that changes to the new member is spooling by each active member; and

(d5) informing the new member that ~~its~~ the subscription information for the new member has been received by each active member.

7. (Currently Amended) The method of claim 1, wherein ~~the determining (e)~~ that an acknowledgement from each active member has been received by the initiator comprising comprises:

(e1) collecting messages from the active members by the initiator, wherein each message informs the initiator that the sending active member is spooling changes to the new member; and

(e2) determining that messages from all active members in the replication group have been received by the initiator.

8. (Currently Amended) The method of claim 2, wherein ~~the determining (f) that a~~ loading of data onto the new member is required further comprises:

(~~f1~~) creating a spill queue for each active member.

9. (Currently Amended) The method of claim 2, wherein ~~the determining (i) that the~~ loading of the data has completed comprises:

(~~i1~~) sending a load done message from the initiator to the new member.

10. (Currently Amended) The method of claim 2, wherein ~~the applying (j) the~~ replication messages stored on the at least one spill queue to the new member comprises:

(~~j1~~) sending a load done message to each active member by the new member;

(~~j2~~) sending an acknowledgement of receipt of the load done message by each active member to the new member; and

(~~j3~~) determining that the acknowledgement of receipt has been received from each active member by the new member.

11. (Currently Amended) The method of claim 1, further comprising:

(~~f~~) performing asynchronous data replication between the active members in the replication group, wherein the replication group includes the new member.

12. (Currently Amended) The method of claim 2, further comprising:

~~(k)~~ performing asynchronous data replication between the active members in the replication group, wherein the replication group includes the new member.

13. (Currently Amended) A method for member deactivation from an asynchronous data replication group in a database system, the method comprising:

~~(a)~~ initiating deactivation of a member of the replication group ~~at~~ by an initiator, wherein the initiator is an active member in the replication group;

~~(b)~~ sending a stop message from the initiator to the deactivating member;

~~(c)~~ sending a stop message from the deactivating member to each active member in the replication group;

~~(d)~~ receiving the stop message from the deactivating member by each active member;

~~(e)~~ stopping a subscription to the deactivating member by each active member;

~~(f)~~ sending an acknowledgement of receipt of the stop message to the deactivating member by each active member;

~~(g)~~ receiving the acknowledgement of receipt of the stop message by the deactivating member from an active member and deactivating a corresponding subscription to the sending active member at the deactivating member; and

~~(h)~~ determining that the acknowledgement of receipt of the stop message from each active member has been received by the deactivating member.

14. (Currently Amended) The method of claim 13, wherein ~~the~~ initiating ~~(a)~~ deactivation of a member of the replication group comprises:

~~(a1)~~ initiating deactivation of the deactivating member by inserting a stop signal into a signal table of the initiator.

15. (Currently Amended) The method of claim 13, wherein ~~the sending (e)~~ a stop message from the deactivating member to each active member in the replication group further comprises:

~~(e1)~~ changing a subscription state for each active member at the deactivating member to 'stopping'.

16. (Currently Amended) A system, comprising:

an initiator node, wherein the initiator node is an active member of an asynchronous data replication group;

a new member node, wherein the new member node is initialized into the replication group by:

initiating a subscription for the new member node ~~at~~ by the initiator node,
sending a list of active member nodes in the replication group from the initiator node to the new member node,

sending subscription information for the new member to each active member node in the replication group,

validating a subscription to the new member node at each active member node and sending an acknowledgement to the initiator node, and

determining that an acknowledgement from each active member node has been received by the initiator node.

17. (Currently Amended) A system, comprising:

an initiator node, wherein the initiator node is an active node of an asynchronous data replication group; and

a deactivating node, wherein the deactivating node is to be deactivated from the replication group by:

initiating deactivation of the deactivating node at by the initiator node,
sending a stop message from the initiator node to the deactivating node,
sending a stop message from the deactivating node to each active node in
the replication group,

receiving the stop message from the deactivating node by each active
node,

stopping a subscription to the deactivating node by each active node,
sending an acknowledgement of receipt of the stop message to the
deactivating node by each active node,

receiving the acknowledgement of receipt of the stop message by the
deactivating node from an active node and deactivating a corresponding
subscription to the sending active node at the deactivating node, and

determining that the acknowledgement of receipt of the stop message from
each active node has been received by the deactivating node.

18. (Currently Amended) A computer readable medium with program instructions, tangibly stored thereon, for member initialization to an asynchronous data replication group in a database system, the program instructions comprising instructions for:

- (a) initiating subscription for a new member ~~at~~ by an initiator, wherein the initiator is an active member in the replication group;
- (b) sending a list of active members in the replication group from the initiator to the new member;
- (c) sending subscription information for the new member to each active member in the replication group;
- (d) validating a subscription to the new member at each active member and sending an acknowledgement to the initiator; and
- (e) determining that an acknowledgement from each active member has been received by the initiator.

19. (Currently Amended) The computer readable medium of claim 18, further comprising instructions for:

- (f) determining that a loading of data onto the new member is required;
- (g) loading the data from the initiator to the new member;
- (h) storing current replication messages from the active members onto at least one spill queue;
- (i) determining that the loading of the data has completed; and
- (j) applying the replication messages stored on the at least one spill queue to the new member.

20. (Currently Amended) The computer readable medium of claim 18, wherein the instructions for initiating ~~(a)~~ subscription for a new member comprises instructions for:

(a1) inserting a signal into a signal table of the initiator to initiate the subscription for the new member.

21. (Currently Amended) The computer readable medium of claim 18, wherein the instructions for sending ~~(b)~~ a list of active members in the replication group comprises instructions for:

(b1) computing the list of active members in the replication group by the initiator;

(b2) changing a subscription state for the new member to 'initializing' at the initiator; and

(b3) sending the list of active members from the initiator to the new member.

22. (Currently Amended) The computer readable medium of claim 18, wherein the instructions for sending subscription information for the new member to each active member in the replication group ~~(c) comprising~~ comprises instructions for:

(c1) receiving the list of active members from the initiator by the new member;

(c2) sending the subscription information for the new member from the new member to each active member in the list of active members; and

(c3) changing a subscription state at the new member for each active member to 'active'.

23. (Currently Amended) The computer readable medium of claim 18, wherein the instructions for validating ~~(d)~~ a subscription to the new member at each active member and sending an acknowledgement to the initiator comprises instructions for:

(d1) receiving the subscription information for the new member by each active member from the new member;

(d2) changing a subscription state for the subscription to the new member to 'active' at each active member, if no loading of data into the new member is required;

(d3) changing the subscription state for the subscription to the new member to 'loading' at each active member, if loading of data into the new member is required;

(d4) informing the initiator that changes to the new member is spooling by each active member; and

(d5) informing the new member that ~~its~~ the subscription information for the new member has been received by each active member.

24. (Currently Amended) The computer readable medium of claim 18, wherein the instructions for determining ~~(e)~~ comprising that an acknowledgement from each active member has been received by the initiator comprises instructions for:

(e1) collecting messages from the active members by the initiator, wherein each message informs the initiator that the sending active member is spooling changes to the new member; and

(e2) determining that messages from all active members in the replication group have been received by the initiator.

25. (Currently Amended) The computer readable medium of claim 19, wherein the instructions for determining ~~(f)~~ that a loading of data onto the new member is required further comprises instructions for:

~~(f1)~~ creating a spill queue for each active member.

26. (Currently Amended) The computer readable medium of claim 19, wherein the instructions for determining ~~(i)~~ that the loading of the data has completed comprises instructions for:

~~(i1)~~ sending a load done message from the initiator to the new member.

27. (Currently Amended) The computer readable medium of claim 19, wherein the instructions for applying ~~(j)~~ the replication messages stored on the at least one spill queue to the new member comprises instructions for:

~~(j1)~~ sending a load done message to each active member by the new member;

~~(j2)~~ sending an acknowledgement of receipt of the load done message by each active member to the new member; and

~~(j3)~~ determining that the acknowledgement of receipt has been received from each active member by the new member.

28. (Currently Amended) The computer readable medium of claim 18, further comprising instructions for:

(f) performing asynchronous data replication between the active members in the replication group, wherein the replication group includes the new member.

29. (Currently Amended) The computer readable medium of claim 19, further comprising instructions for:

(k) performing asynchronous data replication between the active members in the replication group, wherein the replication group includes the new member.

30. (Currently Amended) A computer readable medium with program instructions, tangibly stored thereon, for member deactivation from an asynchronous data replication group in a database system, the program instructions comprising instructions for:

(a) initiating deactivation of a member of the replication group ~~at~~ by an initiator, wherein the initiator is an active member in the replication group;

(b) sending a stop message from the initiator to the deactivating member;

(c) sending a stop message from the deactivating member to each active member in the replication group;

(d) receiving the stop message from the deactivating member by each active member;

(e) stopping a subscription to the deactivating member by each active member;

(f) sending an acknowledgement of receipt of the stop message to the deactivating member by each active member;

(g) receiving the acknowledgement of receipt of the stop message by the deactivating member from an active member and deactivating a corresponding subscription to the sending active member at the deactivating member; and

(h) determining that the acknowledgement of receipt of the stop message from each active member has been received by the deactivating member.

31. (Currently Amended) The computer readable medium of claim 30, wherein the instructions for initiating (a) deactivation of a member of the replication group comprises instructions for:

(a1) initiating deactivation of the deactivating member by inserting a stop signal into a signal table of the initiator.

32. (Currently Amended) The medium of claim 30, wherein the instructions for sending (e) a stop message from the deactivating member to each active member in the replication group further comprises instructions for:

(e1) changing a subscription state for each active member at the deactivating member to 'stopping'.